THE MAC Flyer

SEPTEMBER 1986

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THE MAC Flyer

For Greater Safety in MAC Air Operations

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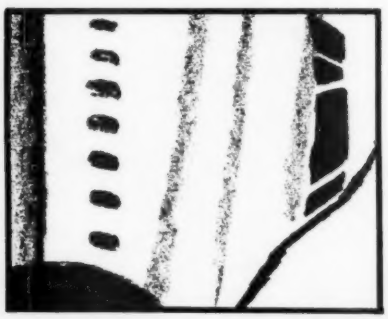

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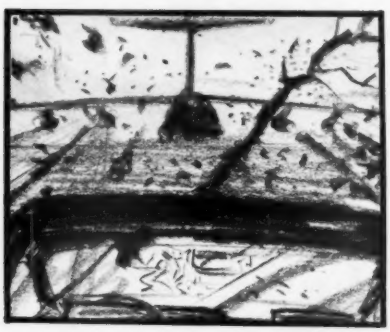

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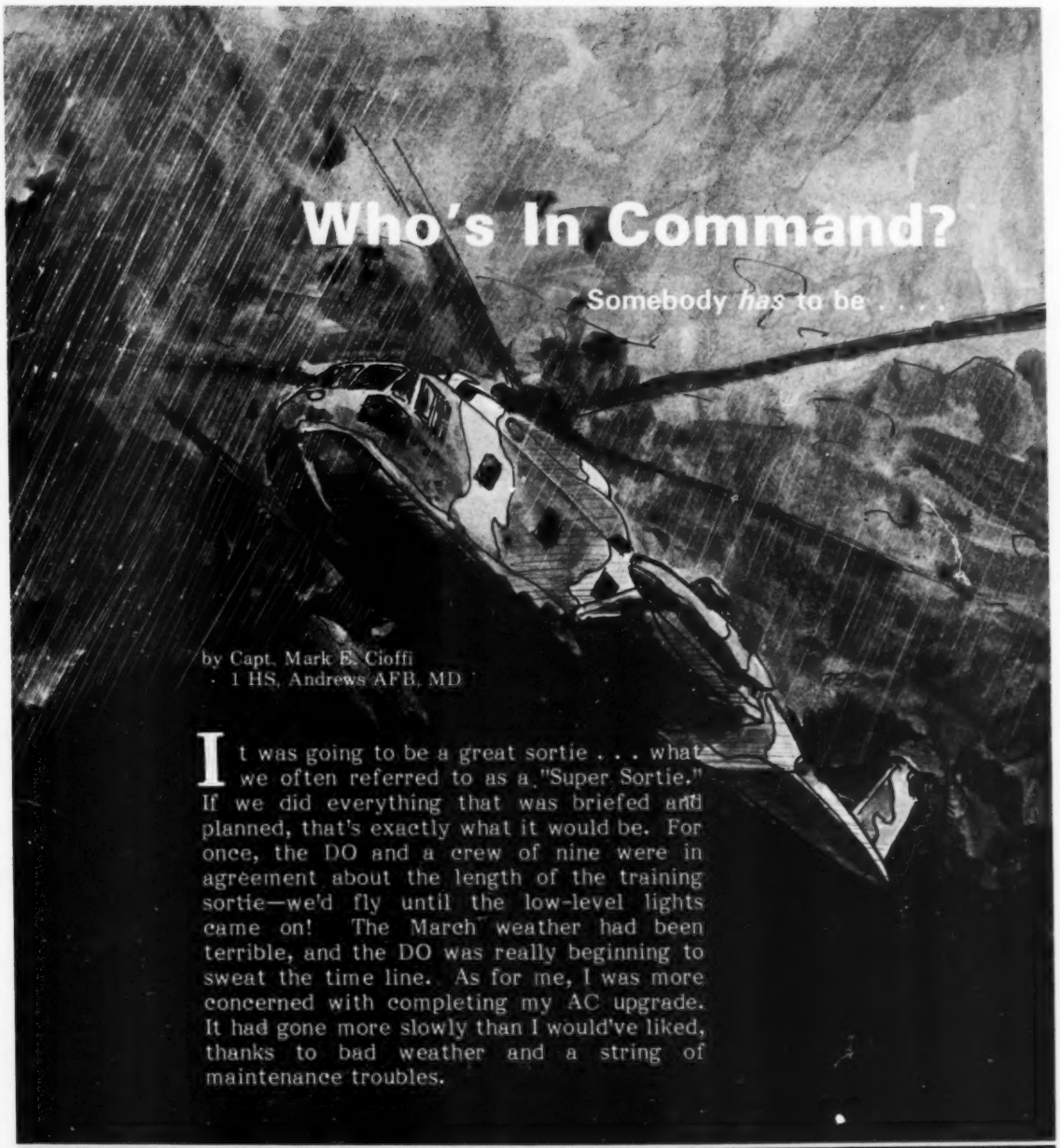


Who's In Command?

Somebody *has* to be . . . .

by Capt. Mark E. Cioffi
1 HS, Andrews AFB, MD

It was going to be a great sortie . . . what we often referred to as a "Super Sortie." If we did everything that was briefed and planned, that's exactly what it would be. For once, the DO and a crew of nine were in agreement about the length of the training sortie—we'd fly until the low-level lights came on! The March weather had been terrible, and the DO was really beginning to sweat the time line. As for me, I was more concerned with completing my AC upgrade. It had gone more slowly than I would've liked, thanks to bad weather and a string of maintenance troubles.

THIRD PLACE WINNER
1986 FLIGHT SAFETY WRITING CONTEST

On this particular afternoon I was going to get personnel airdrop training, night air refueling, and night water hoist practice. Jack, another pilot in the upgrade program, needed night air refueling and some night remote landings. We had three flight engineers aboard as well, Sgt. Henson, who was new to the unit and was getting an orientation sortie; SSgt. Thompson, who was to instruct Sergeant Henson as part of his instructor FE upgrade; and TSgt. Garza, a flight examiner FE who was supervising Sergeant Thompson. In other words, the FEs had a busy schedule, too.

Adding to the confusion, three pararescue specialists (PJs) were trying to get some training. One was learning how to be a jumpmaster while the other two were serving as "students." All in all, a very crowded sortie.

The whole process was going well, and Fred (unit DOV and my instructor for the evening) complimented me as we walked out to the aircraft, on the way I'd organized the details of the mission. Fred was well respected in our unit, and his praise meant a lot to me. The only thing nagging me on the way out was the weather brief we had gotten: intermittent visibility of 1/8 of a mile, intermittent snow and snow pellet showers . . . . I'd seen a lot of this kind of weather in my two years near the Arctic Circle. Showers like that could roll through in a half-hour, and drop a couple of inches of snow just as fast. I'd been on station longer than anyone else on the crew and knew the weather patterns and landscape better than anyone else. The weather shop always did its best, but many conversations with them in the past had convinced me they'd often been surprised by how fast the changes in weather could take place. I was, to put it mildly, wary of the situation we might be faced with by the time we got to the drop zone.

The FEs had figured the HH-3E "Jolly Green" to be just 60 lbs under max gross weight, which sounded about right for a "Super Sortie." Because of the weight, I chose to do a running takeoff rather than picking up to a hover first. I felt good; Sergeant Thompson commented, "That felt better than the TWA flight I was on last week, sir!" I thanked him for the compliment and began to think that things would keep going my way on *this* flight.

The only problem I'd really been having throughout my entire upgrade was getting out of the "copilot mode of thinking." After two years in the left seat, I'd gotten pretty good at tactfully dropping hints to ACs . . . a comment here, a question there, all worded so as not to bruise anybody's ego. But I hadn't really gotten a handle on developing the kind of "tact" that goes with being in the right seat. I was going to learn one heck of a lesson, though.

Once enroute to the DZ, everyone in back started their respective checklists. I stayed on top of them all, calling for each one in succession and making sure the right responses were heard. The closer we got to the jump area, the more obvious it became that everything would have to go like clockwork. The weather was moving in.

I said to Fred, "Things aren't looking good to the north." He agreed, "Yup, it looks pretty bad." We pressed on, and I briefed the approach into the DZ. On downwind, I commented, "It seems like that storm is moving in our direction. Whattaya think, Fred?" He waited a moment, and then said, "Yeah, it kinda looks like it." I thought, this isn't like Fred. He seems unusually vague.

"If it'd been up to me, we never would've landed at the DZ at all!"

Jack, the other "student pilot," was to serve as ground party for the jumps, and he wasn't shy about voicing his opinion.

"Hey, it looks pretty bad out there. Let's RTB, let the PJs hop off, and just go hit the refueling track."

The PJs promptly reminded everyone how badly they needed jumps for upgrade and currency and the subject was dropped. I've got to admit I liked Jack's idea a whole lot better than attempting to get the jumps off.

We landed at the drop zone without any trouble, but the wind was beginning to pick up. Jack and the PJs got out to mark the DZ and check the winds. By now we could see

snow pellet showers in the distance. I made my most forceful comment to date: "Hey, Fred, I don't think we're going to be able to do this. Why don't we go do some night remotes out to the east to wait this stuff out?" He agreed. "Yeah, that might be a good idea." His response was again vague (for him), but enough to get me to act. As I started to wave everyone back into the aircraft the snow pellets began to fall. The weather came on fast, and the winds really started to gust. Our options were shrinking fast, either sit on the ground for a half-hour or make a break for it and beat the storm. The newly-arrived flight engineer was already in the jump seat, so I called for the takeoff checklist right away. I briefed a right turn to depart after picking up to a hover. Power was going to be tight, but it was time to either go or wait it out. I glanced over at Fred for final approval, but he still seemed apathetic at best.

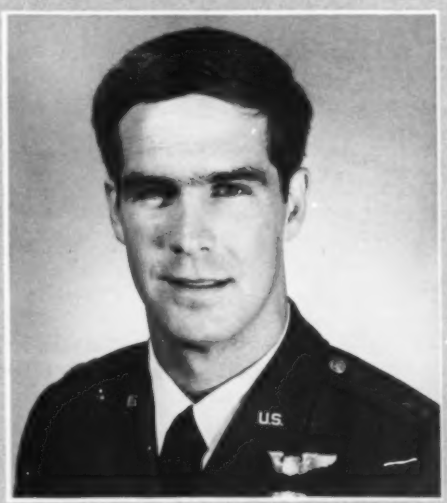
We got up into the hover okay, but the moment I tried to turn the nose right (which was downwind) the FE came up on the intercom. "TORQUE!" I instantly lowered the collective and got things back down below the red line, but doing so started us moving down and right. I tried again, pulling the power in easy, but the FE was eyeing the torque needles and called out "torque" again. I reduced power, and down we went again. Things weren't going well, and it became apparent I was in a bad situation. As these thoughts raced through my mind, I heard the words that every student dreads, the IP saying "I've got the controls!" As smoothly as ever, Fred put the heavy Jolly down without incident.

We sat for 30 minutes while the showers passed. Not surprisingly, there wasn't a whole lot of conversation during that time. As soon as the weather broke, we went straight back to base for a thorough debrief. Everyone had their say. When Fred finally asked me for my opinion on the evening's events, I told him flat out, "If it'd been up to me, we never would've landed at the DZ at all!" As we stared at each other, what had happened suddenly dawned on both of us.

First, it *was* up to me; I was supposed to be in command. Second, he was trying to be a copilot, and I was trying to be an aircraft commander, and *neither* of us had done a very good job of role-playing.

We thought about it a little more; a stan-eval pilot spends very little time acting as a plain old copilot, and it's easy to forget that a good CP makes constructive inputs to his AC. For my part, I wasn't out of the "copilot mode of thinking" yet. Neither of us had thought to brief this important aspect of our flight before the mission. He sat there, trying to give me every chance to make a decision for myself, and I sat there, not knowing exactly what he expected of me as the "acting" AC.

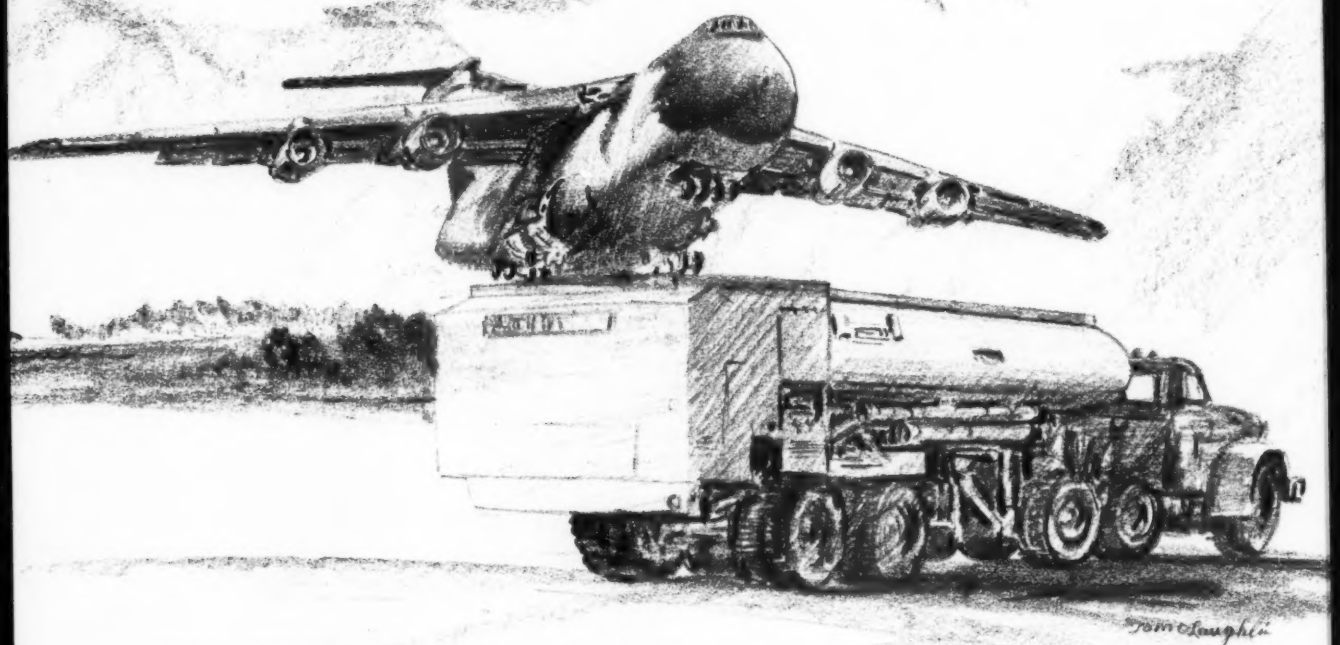
That flight taught me something—a lesson that probably has been learned before, and will certainly need to be learned again and again as copilots move up to become aircraft commanders. It takes a long time to develop the "habits of decision-making" that are the mark of an AC who really *commands*, and those habits should be taught thoroughly. The "copilot mode of thinking" has no place in the right seat of a helicopter, or the left seat of a heavy. Fred also learned something too. He briefs his "student pilots" who are upgrading to make the decisions they think ought to be made, and he will make inputs when requested or as needed for safe flight, as a good copilot would.



Capt. Mark E. Cioffi began his Air Force career by enlisting on 12 May, 1980. He received his commission through OTS on 3 Dec 81. After completing UPT-H, he was assigned to Det 14, 67 ARRS, Keflavik, Iceland. In June of 1965 he was assigned to his present unit, the 1st Helicopter Squadron at Andrews AFB, Maryland.

Speak Up!

You owe it to yourself



FROM: SEF (Capt. MacKenzie, AV 666-5412)
SUBJECT: National Transportation Safety Board Study of Runway Incursions

TO: Wing Flight Safety Officers

1. The National Transportation Safety Board recently completed a study of runway incursions. I believe a summary of the study (officially NTSB/Special Investigation Report-86-01) will provide a good example of how one factor in the flight environment, in this case pilot/controller communication, can play such a critical part in safely operating aircraft. The study is also a rare examination of problems encountered in the civilian flying world that apply to the military flying world in every respect.

2. The Board defined runway incursion as any occurrence involving an aircraft, vehicle, person, object, or procedure that impedes the takeoff, intended takeoff, landing, or intended landing of an aircraft. That's a pretty broad definition, but we have to remember while not all missions involve high-risk operations, they all begin and end the same—with the aircraft being maneuvered

around an airport runway and taxiway system.

3. FAA categorizes runway incursions as either operational errors (controller error) or pilot deviations. However, their evaluation of data from operational errors, pilot deviations, and NASA's ASRS (Aviation Safety Reporting System) indicates the majority of these incidents were precipitated by pilot actions. In nearly all incursions, even those that occurred during periods of limited visibility, pilots had the last opportunity to observe the developing conflict and take evasive action to avoid collision. In several of the incursions examined during this special investigation, it was, in fact, the pilot's alertness and evasive action that prevented a collision. Although FAA describes runway incursions as either operational errors or pilot deviations, the Safety Board investigation revealed that these are *not* mutually exclusive categories. Runway incursions investigated by the Board were frequently caused by a combination of pilot and controller actions (or lack of action). Several incursions cited as operational errors were actually set in motion by pilot actions. NTSB found most incursions that the FAA categorized as operational errors could have been prevented by proper pilot actions.

4. A few examples will reinforce the Board's (and my) conviction that it's the person(s) driving the aircraft who has the key role in preventing these incursions. Some of the incursions might have been averted if pilots (and controllers) had been more attentive to radio communications, had used proper radio phraseology, had read back clearances, or had scanned more effectively before entering an active runway. For example, an airplane taxied onto an active runway without clearance while another airplane was taking off from the same runway. The pilot of the taxiing airplane had been instructed to taxi to the runway but hold short. The pilot acknowledged the instruction with "okay," but later reported that he did not understand that he was to hold short of the runway. The pilot used improper phraseology, and the controller accepted an improper acknowledgment.

5. Another incursion involving a communications problem occurred when two aircraft initiated takeoff after only one had been cleared. The pilot not cleared for takeoff had requested takeoff from an intersection to expedite departure. He assumed the clearance for the other airplane was for him. Apparently the pilot was so intent on expediting his departure that he also failed to acknowledge the clearance, thus denying the controller a signal that the two aircraft were about to conflict.

6. A pilot commenced his takeoff based on a clearance given another aircraft with a similar call sign. The pilot attempted to expedite the departure because the takeoff instruction included the phraseology "without delay." The next day, at the same airport, an aircraft preparing for departure was cleared to taxi to the departure runway but also to hold short of another active runway. The captain taxied the aircraft across the active runway. He was operating the radio while the copilot was attending to other duties. Neither recalled hearing the "hold short" instruction, although the captain acknowledged it.

7. Miscommunication played the central role in several pilot-induced and controller-induced incursions. In one incursion classified by FAA as an operational error, the pilot failed to communicate to either the ground controller or the local controller that he intended to depart from a runway intersection rather than the end of the runway. According to tower personnel, the procedure had been used many times by pilots who were employed by the same air taxi cargo operator, usually without explicitly requesting tower approval. The pilot taxied onto the runway into the path of a landing airplane and then, after being alerted by the pilot of the landing airplane, taxied clear just in time to avoid collision. The local controller was partially at fault for not verifying the airplane's position but the pilot contributed to the error by not calling tower for an intersection takeoff; he then failed to effectively scan the runway before taxiing into position.

8. Several runway incursions the FAA classified as operational errors occurred, in

part, because pilots delayed reporting information to controllers. In one incursion, a pilot, cleared to taxi his airplane across an active runway, encountered a delay as he waited for another pilot to taxi clear of the runway. Had the pilot of the crossing aircraft notified the controller of the delay, the controller would have been reminded that the crossing had not been completed. A similar incursion involved crossing an active runway by two aircraft, the second of which was being taxied slowly and was not near the runway when cleared to cross. Obviously, under such circumstances, it is not a safe practice for pilots to accept, or for controllers to issue, a runway crossing clearance when it's obvious there will be a significant delay before it can be carried out.

9. In yet another incursion, the pilot was monitoring a company radio frequency while awaiting clearance. He initiated a takeoff in response to a takeoff clearance issued to another aircraft, precipitating a near-collision. The chatter the pilot heard over the company frequency may have distracted him. Listening to frequencies other than the local or ground control frequency during taxi is a poor practice. We may need to listen to the command post, but have someone not responsible for controlling the airplane do it.

10. Of course, some incursions result in more than embarassment for the people involved. One accident the FAA classified as an operational error might have been prevented by timely pilot communication. The pilot was cleared to taxi his airplane into position to hold for an intersection departure. The airplane was later struck by a landing airplane. The most perplexing aspect of the accident was that while the departing airplane was on the runway awaiting a takeoff clearance for nearly *6 minutes*, the pilot did not contact the controller to determine the reason for the delay. Although the pilot had no obligation to radio the controller, the accident probably would not have occurred had the pilot reminded the local controller that he was still in position awaiting a takeoff clearance.

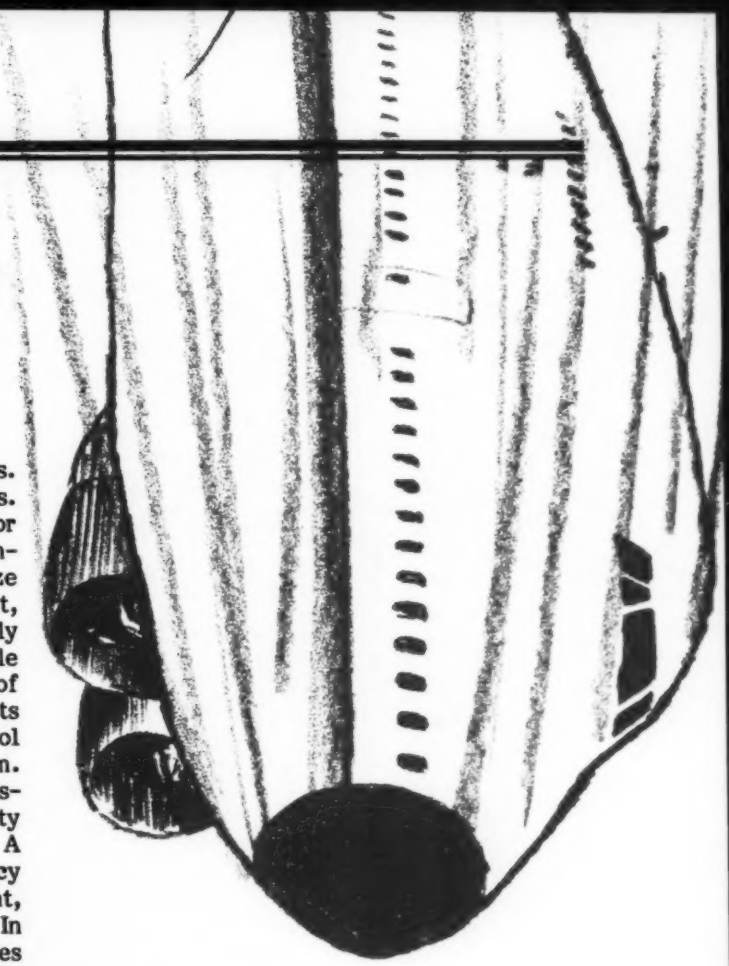
11. The Board also found that runway and taxiway markings on airport surfaces can contribute to pilots becoming disoriented. The most famous accident of this type occurred in fog at Anchorage where a commercial DC-10 collided with a light twin. The Safety Board concluded the DC-10 crew became confused and lost because of dirty, poorly lit runway and taxiway signs. Some signs were not in place to mark part of the taxi route. The crew *thought* they were on the assigned runway, started to take off, and collided with the other airplane. Are the signs on *your* base adequate, well lit, and readable? To attest to the effectiveness of adequate signs, Board members met with the managers of one airport and suggested they install unlighted reflective signs at critical locations. There had been 16 incursions in the 11 *weeks* preceding the sign installation. In the first 7 *months* after the signs were installed, there were five incursions.

12. The Safety Board believes runway incursions could be prevented through reinforcement of sound communication practices. The Board believes the FAA could be instrumental in eliminating many runway incursions if it emphasized in operational bulletins, the Airman's Information Manual, general aviation seminars, and pilot training programs, the importance of reading back taxi, hold-short, runway crossing, and takeoff clearances in proper phraseology; the importance of reporting when unable to promptly cross, take off from, or clear a runway when so cleared; and the need to scan properly before entering or crossing a runway. The same message should come through loud and clear for the blue-suiter.

13. Obviously, even though these incursions occurred in the civilian aviation community, the same potential for disaster confronts our crews every day. In most of these incursions, there was a breakdown in communication. A simple radio call asking for clarification or repeating an instruction might be all that's needed to prevent a hazardous situation from developing. In the end, it all boils down to people and professionalism. When you pass this information to your crews, stress that no one's perfect; we all need to check on one another occasionally. That person in the tower or the other seat can't read your mind. In this business, no question from a prudent person is dumb.

Preferential Attention

Distracted?

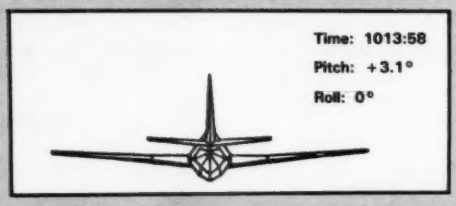


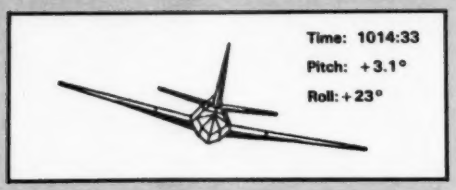
Digital readouts. Light emitting diodes. Laser optics. Computer assisted displays. Everything about avionic's packages for today's aircraft says sophisticated complexity. With computers that can analyze data and predictably arrive at select, preprogrammed conclusions, practically without fail, it's not hard to see why our role in flight has been relegated to that of overseer. Increasingly, today's crew efforts are expended in monitoring flight control functions, instead of performing them. Human fallibility in this role has been discussed at length, including our susceptibility to rely too heavily on automated systems. A similar problem is our documented tendency to focus on even trivial problems in flight, sometimes to the exclusion of all else. In February 1985, the crew of China Airlines Flight 006 plunged into the near-fatal results of preferential attention.

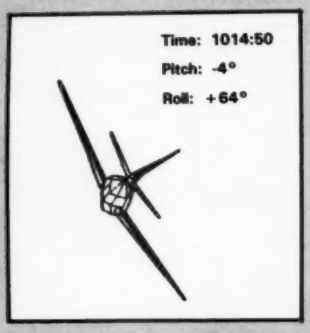
Originating in Taipei, Taiwan, China Airlines Flight 006 was a regularly scheduled transpacific passenger flight bound for Los Angeles, California. The augmented crew of 23 took off at 0022 Pacific Standard Time (PST) on 19 Feb 86 with 251 passengers. The flight was uneventful until just west of reporting point Reedoo, located about 300 nm northwest of San Francisco, California.

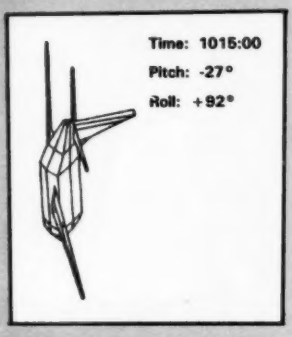
As they approached Reedoo, the aircraft began encountering light clear air turbulence. The crew had set the autopilot to the Performance Management System (PMS) mode of the autopilot. The automated system was maintaining 41,000 feet and .85 Mach (M). Due to the clear air turbulence, the airspeed began to fluctuate between .84M and .88M, and the PMS followed the airspeed with appropriate throttle movements. The airspeed fell to .84M, and the PMS advanced all four throttles, as expected. Engines number 1, 2, and 3 responded normally, but the number 4 engine instruments did not indicate an acceleration. The aircraft's IAS began decreasing. The flight engineer moved the number 4 throttle with no reaction, then informed the captain the number 4 engine had flamed out.

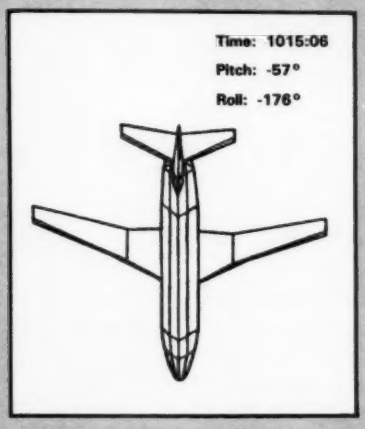
The captain was monitoring the airspeed, which dropped through 240 KIAS as they continued to decelerate. This prompted him to turn the autopilot's speed mode selector switch from "PMS" to "off," releasing it from the altitude hold command, switching to the pitch attitude hold mode and maintaining the INS ground track, still without any pilot input. His next effort was to rotate the pitch

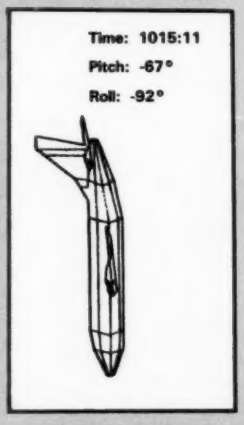


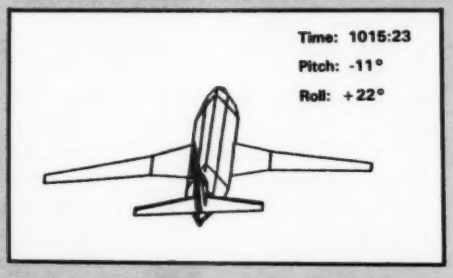












control wheel on the autopilot manual control module in the nose-down direction to arrest the airspeed loss, however, the airspeed continued to bleed off. At this point the captain disengaged the autopilot to manually lower the nose in a further attempt to arrest the loss of airspeed.

The first officer stated he looked up after a radio call to find the aircraft in a right bank. He then observed the captain disconnect the autopilot, and when he noticed the aircraft continue to bank to the right, he informed the pilot.

The captain said after the first officer confirmed the right roll, he concentrated on the ADI to make a left wing down correction. He stated that while he watched, the horizontal reference line rolled to the vertical position. Not seeing any failure flags, he quickly crosschecked the copilot's ADI and the standby ADI. They looked the same as his own. The aircraft had now entered clouds, and the pilot stated he did not know what the aircraft attitude was at that point.

Just when the ADIs rotated, the flight engineer informed the captain the other three engines had lost thrust and, simultaneously, the aircraft "dropped all of a sudden." The first officer felt both his and the captain's ADIs had "malfunctioned," the aircraft was out of control, and he had the impression the aircraft had entered a steep bank.

The aircraft was now in the clouds and the crew was uncertain of the aircraft's roll attitude. As the airplane accelerated, the captain continued to pull back on the control column. Suddenly, the aircraft began to decelerate rapidly. The captain said the airspeed decreased to between 80 and 100 KIAS and at that point he again lowered the nose, but then the aircraft began rapidly accelerating. The captain, assisted by the first officer, pulled the control column back, and the aircraft began decelerating again. The captain then lowered the nose smoothly, the aircraft began a gradual acceleration just as it emerged from the clouds.

As the aircraft broke out of the clouds, it was accelerating through 180 KIAS. Now able to use outside references, the captain regained control of the aircraft. The first officer stated he saw the ADIs "coming back" at about the same time.

The flight engineer said the numbers 1, 2, and 3 engines "came in," but the number 4 engine was unresponsive. When he placed it in the ground start position, however, the engine did start. It was now about 1017 PST, and the crew contacted Oakland ARTCC, reporting they had experienced a "flameout, ah, we emergency (sic). . . . We are *niner thousand feet* . . . ."

The crew assessed the incident, noting the body gear door annunciator lights and the body landing gear down lights were on. Additionally, they noticed the number 1 hydraulic system fluid level gauge indicated empty. Because of these indications, the captain leveled off at FL 270 (maximum operating altitude with the landing gear extended is 29,000 feet). The pilot then requested and received clearance to San Francisco. AT 1039 they redeclared an emergency and indicated they had injuries onboard.

During the incident, the aircraft dropped 30,769 feet in 2 minutes and 25 seconds. The resultant aerodynamic forces overloaded several portions of the aircraft.

ANALYSIS

The National Transportation Safety Board (NTSB) found the flightcrew was properly certificated and qualified for flight. The aircraft was properly maintained with no pre-existing maintenance discrepancies that could have contributed to the accident. Their review of the data from the digital flight data recorder revealed the ADIs had not failed. It's most likely the crew was spatially disoriented and didn't believe the ADIs. As a result, they didn't recognize the unusual attitude of the aircraft and, consequently, were unable to take the correct action to recover the airplane until it began to emerge from the clouds. The NTSB then focused its investigation on two areas. First, they sought the cause of the loss of thrust on the number 4 engine. Second, they wanted to determine why the flightcrew was unable to maintain control of the airplane after the loss of thrust.

The Engine

Careful examination of the number 4 engine revealed it had experienced a lean shift of the acceleration schedule, resulting in a reduced fuel flow available for acceleration. Consequently, the number 4 engine initially "hung" at slightly above 1.0 EPR, and later flamed out. The engine malfunction, however, was not cited as causal to the mishap.

The Flightcrew

The NTSB turned to the complex issue of why an experienced aircrew would lose control of their aircraft after the loss of thrust on one engine during high altitude cruise.

The NTSB established boredom, monotonous environmental conditions, circadian desynchronosis, and overreliance on automated flight systems didn't degrade the decision-making and monitoring capabilities of either the first officer or the flight engineer.

The Board concluded the captain wasn't significantly affected by boredom, monotony, or circadian desynchronosis. Overreliance on automated systems, however, did affect him.

By leaving the PMS connected after discovering the loss of thrust on number 4, the pilot kept himself out of the "control loop." This lack of a "hands on" relationship with the aircraft prevented him from recognizing the increasing control input requirements to maintain level flight, and so he didn't recognize the assymetric forces on the aircraft. This reaction was predictable.

Research reported in the Board's report indicates anyone actively controlling a system will demonstrate "faster and more accurate" failure detection performance than those merely monitoring the system. Also, pilot response time will exaggerate a problem even after it's detected. Actively controlling a system provides additional sensory clues for the operator. Accident investigations have also discovered flightcrews are reluctant to disconnect an automated flight system, even though the system may be operating outside of system limitations or will not accept or maintain programmed inputs.

By the time the captain of Flight 006 disengaged the autopilot, the aircraft's upset was well advanced, to the point that immediate and proper corrective action was required. The captain was not only unable to assess the situation, he was confused by it. The DFDR data indicated his actions probably aggravated the situation. In his efforts to analyze the situation, the captain

recognized the decreasing airspeed and made a nose-down control input to correct for it. While the captain monitored the airspeed indicator, the aircraft continued to roll right, passing the 45° right-wing-down attitude. Although the ADI is juxtaposed to the airspeed indicator, the pilot never noticed the aircraft attitude until after disconnecting the PMS.

The captain was distracted by the decreasing airspeed. As his efforts failed to correct the problem, his attention became so focused on the airspeed his instrument scan broke down completely, and his visual attention became fixed on the airspeed indicator. He was unable to assess the approaching loss of aircraft control.

FINDINGS

The NTSB wrote 11 findings in this mishap; the last six follow:

- The captain did not disengage the autopilot in a timely manner after the loss of thrust.
- The captain was distracted from his flight monitoring duties by his participation with the flight engineer in the evaluation of the number 4 engine malfunction.
- With the exception of the loss of thrust, no other airplane malfunction affected the performance of the airplane; the loss of thrust did not contribute to the accident.
- The captain was also distracted by his attempts to arrest the airplane's decreasing airspeed, and this contributed to his failure to detect the airplane's increasing bank angle.
- The lateral control deflections required to maintain level flight under conditions of thrust assymetry and decreasing airspeed exceeded the limits of the autopilot's lateral control authority, causing the aircraft to yaw and roll right. The captain lost control of the aircraft when, after disengaging the autopilot, he failed to make the proper flight control corrections to recover the airplane.
- The aircraft damage resulted from acceleration forces and high airspeeds that occurred during the upset and recovery maneuvers.

PROBABLE CAUSE

The National Transportation Safety Board determined the probable cause of this accident was the captain's preoccupation with an inflight malfunction and his failure to monitor properly the airplane's flight instruments, which resulted in his losing control of the airplane.

Contributing to the accident was the captain's overreliance on the autopilot after the loss of thrust on the number 4 engine.

APPLICATION TO MAC

This mishap clearly demonstrates the simplicity with which even finely honed skills can be disrupted. The problems China Airlines Flight 006 encountered originated within the human element, which all but eliminates aircraft type in the analysis of exposure and susceptibility. MAC aircrews fly in the same environment, with the same factors as the mishap crew. We're exposed to the same deleterious effects of circadian desynchronosis, monotony, and fatigue, and we prepare with similar education, training, and evaluation programs.

Even after such infamous mishaps as the ill-fated Eastern Airlines L-1011 which crashed in the Florida Everglades, one of the most publicized tragedies resulting from aircrew in-flight preoccupation, the problem remains. The L-1011 crew failed to monitor the autopilot, fixating on a landing gear warning light. The altitude hold mode of the autopilot was accidently disengaged, resulting in a gradual descent. MAC has already recorded mishaps with causes originating from the same problem.

Safe flight requires a conscious effort by the crew of every aircraft. An effort which is deceivingly difficult. With systems which operate accurately more than 98% of the time, how do we motivate ourselves to keep a vigil eye? The answer is to develop a crosscheck independent of pass/fail evaluation. When we shift our mindset from checking to see if the system is working properly to checking to see *what* the system is doing, we're half way there. The final step (and perhaps the most difficult) is to develop the ability to continue the crosscheck, even after a discrepancy is discovered. That remains a product of self-discipline, cultivated through dogmatic adherence to checklists and proper procedures. Sometimes, just watching is the most difficult job of all.

Adapted from NTSB/ARR-86/03

Flying-Hour Milestones

15,000

SMSgt Warren G. Swatling, 139 TAS

10,000

Lt Col James L. Farmer, 57 MAS
CMSgt James M. Bishop, Jr., 183 TAS
MSgt Donald P. Durbin, 301 MAS
MSgt Lawrence E. Monte, 928 TAG

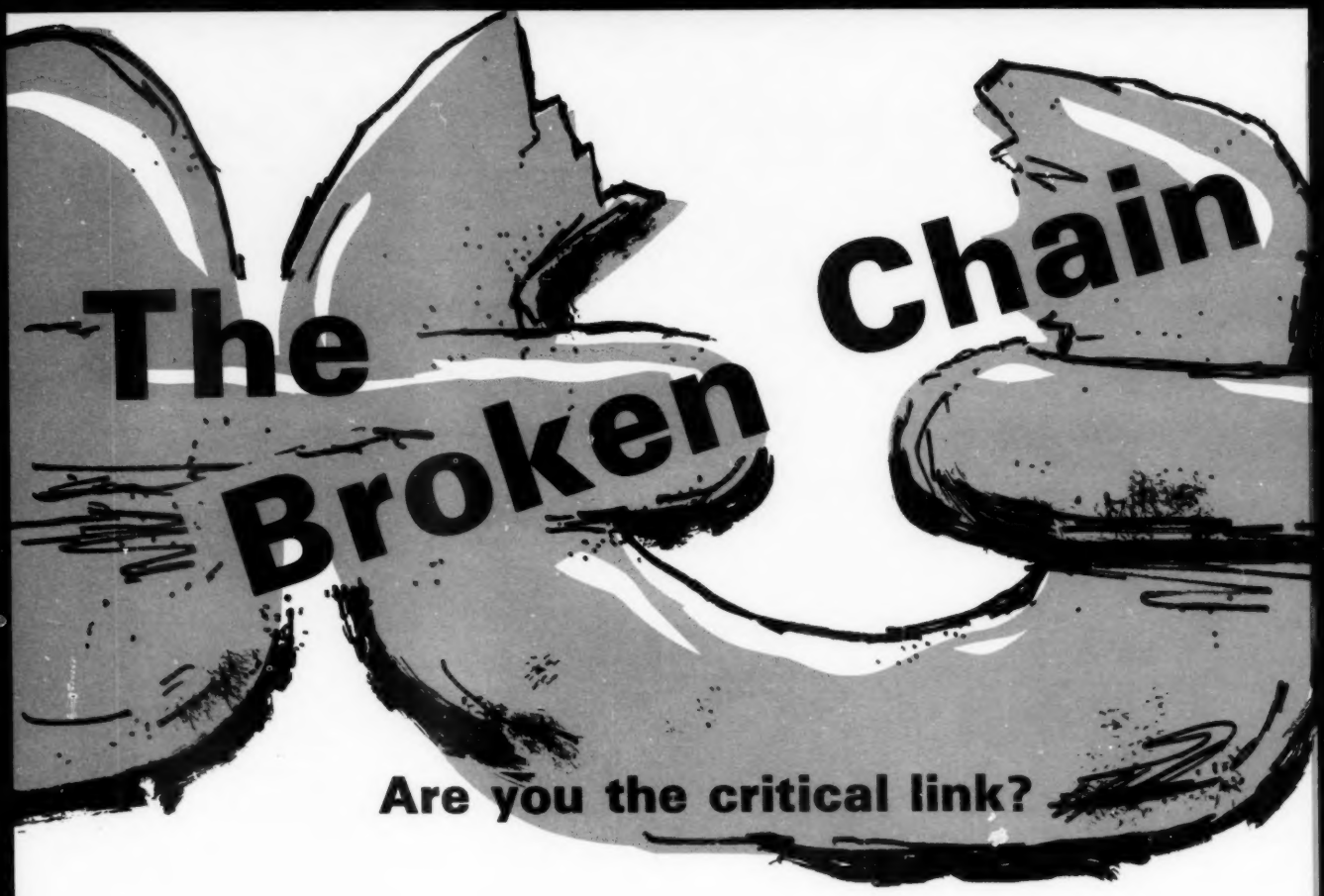
5,000

Col John S. Rogers, 41 MAS
Lt Col Lance E. Hancock, 86 MAS
Lt Col John A. Lerda, 1 HS
Lt Col Robert Kaufman, 1403 MAS
Maj Kenneth L. Hopfer, 185 TAS
Maj James J. Nicolaus, 345 TAS
Maj Thomas A. Straus, 57 MAS
Maj Paul W. Thompson, Jr., 86 MAS
Maj Joseph R. Wolozyn, 21 AF/DOV
CMSgt Douglas E. Dingman, 139 TAS
SMSgt Phillip Lucero, 86 MAS
SMSgt Transito Trujillo, 39 ARRW
MSgt Raymond E. Cook, 86 MAS
MSgt Stephen R. Gildea, 4 MAS
MSgt Thomas L. Gillispie, 86 MAS
MSgt John E. Gosch, 4 MAS
MSgt Robert Holmes, 17 TAS
MSgt Friedrich D. Jenkins, 39 ARRW
MSgt James H. Lujan, 86 MAS
MSgt Wayne A. Mapano, 86 MAS
MSgt Robert W. Minard, 34 TAS
MSgt Dennis J. Morgan, 139 TAS
MSgt Gilbert L. Paganini, 4 MAS
MSgt Rayfield Taylor, 4 MAS
TSgt Terance L. Frye, 4 MAS
TSgt Philip T. Holbrook, III., 4 MAS
TSgt Walter E. Salley, II., 6 MAS
TSgt Thomas B. Saucier, 4 MAS
SSgt Randall A. Jones, 4 MAS
SSgt Leon J. Kurcewicz, 6 MAS

2,500

Maj Robert P. Gill, 71 ARRS
Capt Henry S. Murphy, 55 ARRS
Capt Terry D. Stice, 1403 MAS
MSgt Dale A. Follis, 1 HS
TSgt Henry G. Hicks, 1 HS
TSgt John T. Richardson, 33 ARRS
TSgt Peter W. Zilink, 41 ARRS

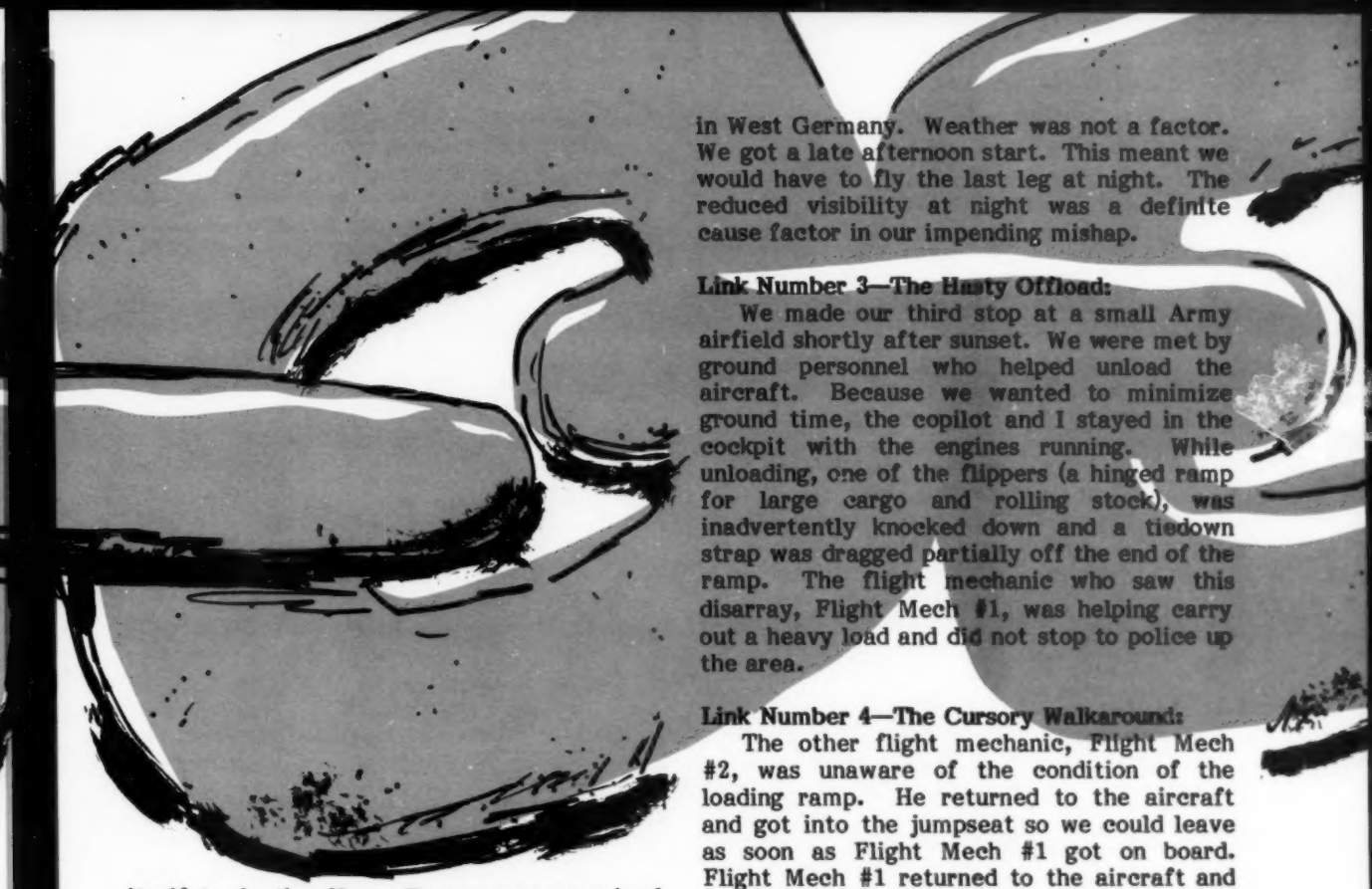
Ranks and units are those at time of award. See MACR 900-3 for details on how to apply for your own milestone award.



by Maj. William B. McGlothlin
82 FTW, Williams AFB, AZ.

As a Flight Safety Officer at Reese AFB, I learned that accidents are the result of many factors. Some of these factors are simply a sequence of events and have no real bearing on the accident. Other factors are of such significance they are considered cause factors. This means that if one of these cause factors can be eliminated or changed, the accident probably would have been avoided. In a sense, these cause factors hang together like links of a chain, the objective in accident prevention is to break the chain of events leading to the accident.

When flying CH-53s in Germany, I was the aircraft commander on a mission that nearly terminated in catastrophe. To fully understand the chain of events that led to the accident, you need to know some of the basics of helicopter flight. A helicopter generates lift by rotating its "wing" through the air at high speed. The lift produced by the main rotor is perpendicular to its plane of rotation. Therefore, the pilot controls the direction of flight (stationary hover, rearward, sideward, or forward) by tilting the rotor disc. The force turning the main rotor applies equal but opposite torque on the body of the helicopter, causing it to rotate opposite the direction of rotor rotation; so, single rotor helicopters must have an anti-torque rotor on the tail to keep the aircraft flying. As with any rotating mass, both these rotors must be precisely balanced and tracked. Out of balance conditions or flapping rotor blades can cause such extreme vibrations that a helicopter can literally beat



itself to death. Harry Reasoner summarized it this way: "A helicopter does not want to fly. It is maintained in the air by a variety of forces and controls working in opposition to each other, and if there is any disturbance in this delicate balance, the helicopter stops flying, immediately and disastrously." The links in the chain of events leading to my accident follow:

Link Number 1—Crew Make-up:

At the time of the mishap, my squadron was involved in a base-wide exercise. We were manning the squadron for a 24-hour operation and all crews were tasked for 12-hour crew days. Also, in an effort to improve mission capability, each crew was manned with two flight mechanics instead of one. This, however, was not that unusual from our day-to-day operation. Nevertheless, with only one flight mechanic onboard, the mishap would probably have been avoided.

Link Number 2—Night Sortie:

Our mission for the day was to take spare parts and supplies to several remote locations in West Germany. Weather was not a factor. We got a late afternoon start. This meant we would have to fly the last leg at night. The reduced visibility at night was a definite cause factor in our impending mishap.

Link Number 3—The Hasty Offload:

We made our third stop at a small Army airfield shortly after sunset. We were met by ground personnel who helped unload the aircraft. Because we wanted to minimize ground time, the copilot and I stayed in the cockpit with the engines running. While unloading, one of the flippers (a hinged ramp for large cargo and rolling stock), was inadvertently knocked down and a tiedown strap was dragged partially off the end of the ramp. The flight mechanic who saw this disarray, Flight Mech #1, was helping carry out a heavy load and did not stop to police up the area.

Link Number 4—The Cursory Walkaround:

The other flight mechanic, Flight Mech #2, was unaware of the condition of the loading ramp. He returned to the aircraft and got into the jumpseat so we could leave as soon as Flight Mech #1 got on board. Flight Mech #1 returned to the aircraft and either forgot about the condition of the ramp or assumed Flight Mech #2 had cleaned it up. Flight Mech #1 did not walk completely around the aircraft, but checked the drain lines on each side of the aircraft. After he got on board, I closed the ramp.

Link Number 5—The Trapped Strap:

When the ramp closed, the flipper was wedged in the door and the tiedown strap was trapped between the flipper and the ramp door. Approximately five feet of the nylon strap and the three-pound ratchet strap were hanging outside the helicopter.

Link Number 6—The Malfunctioning Switch:

The CH-53 is equipped with a panel of advisory lights and a panel of caution lights. One of the advisory light functions is to let the pilots know if the ramp is completely closed or not. Because the flipper was trapped in the door, the door was unable to close completely and was held ajar about three inches. The left side uplock switch malfunctioned and indicated that the door was completely closed. Oblivious to any

problems, we took off about 30 minutes after sunset enroute to our mishap.

Link Number 7—Non-Communication:

Shortly after takeoff, Flight Mech #1 switched places with Flight Mech #2. As Flight Mech #2 sat in the back eating his supper, he noticed something flapping outside the ramp door window. Without saying a word to anyone, he unplugged from his intercom cord and walked to the back to investigate. He noticed the flipper and tie-down cord trapped in the door. Flight Mech #1, in the jumpseat, saw Flight Mech #2 looking at the ramp and saw that the flipper was stuck outside. (Having the flipper stuck outside is not a particularly dangerous situation except that there is an increased potential for a dropped object.) Without saying a word, Flight Mech #1 opened the ramp door so the flipper could be pulled in.

Link Number 8—Contact:

As soon as the door cracked open, the tiedown strap was free to go—and go it did, right through the tail rotor. The immediate indications in the cockpit were a ramp open advisory light and a heavy, high frequency vibration. When I asked what had happened, Flight Mech #1 told me the flippers were hanging and asked for permission to unplug and go help pull them in. I agreed—anything to get rid of that teeth-shattering vibration. I also knew that there was a potential for a dropped object so I began a left turn to avoid flying over a small town. It was at this time my copilot gave me some good advice as he lowered the landing gear and said, "Let's land!"

Night landings in an unlit, forested area aren't usually warranted, but because of the intensity and frequency of the vibrations, I decided something else must be wrong and began looking for a landing area. As it happened, it was harvest time in the area, and there was just enough light to make out a small wheat field in the midst of the dark woods about a mile in front of us. I set up an approach to the far side of the field to be sure I cleared the trees on the near side.

The Missing Link:

My copilot and I busied ourselves completing checklists and getting ready for the landing. When we were still about 100 feet in the air, we hit it! The last thing we were expecting on this night emergency landing were powerlines across an otherwise open field. Sparks flew as we lit into the lines. I could no longer control the helicopter and we flipped completely over and began falling to the ground inverted. Falling inverted in a helicopter at night is an experience that exceeds your wildest imagination. I don't remember the actual impact with the ground because as the main rotor blades began to flap, one sliced through the cockpit and took off my head.

The Real Thing:

There *were* powerlines across the field, but I never saw them until daylight the next day. If we *had* hit them, I believe the result would have been pretty much as I described above. The highlines were on our approach path but when we were still about 200 feet in the air, my copilot gave me his next bit of sage advice, "Powerlines!" I immediately leveled off until we had safely passed the wires. We then continued to an uneventful landing.

The Broken Chain:

This mishap shows how cause factors tend to link together until an accident occurs. If our crew had broken the chain somewhere prior to Link Number 8, we could have avoided any damage to the aircraft and this story would simply have been a "There I Was" tale. In God's providence, we did break the chain prior to hitting the highlines, otherwise no one would ever have known what really happened.

I learned from this mishap to anticipate problems when I fly. To quote Harry Reasoner again, "This is why a helicopter pilot is so different from being an airplane pilot, and why, in general, airplane pilots are open, clear-eyed, buoyant extroverts, and helicopter pilots are brooders; introspective anticipators of trouble. They know if something bad has not happened, it is about to."

I now fly fixed-wing aircraft instead of fling-wing, but I still look for those links lining up. Some of them I have no control over, such as night flights, but where I can, my goal is to make as many links as possible "missing links "

This crew's coordination fell ... Two Miles Short

by Capt. Peter D. Pasko
8 FTS/Check Section
Vance AFB, OK

Pokey 11, a C-130 Hercules, had been cruising at FL 250 for approximately two hours. The final leg of the mission, according to the preflight planning documents, would last about four hours. The crew could finally sense the feeling of being home again in the company of good friends.

Maj. John Wright, the aircraft commander, was glad the week-long TDY was finally coming to an end. The past week seemed very long and he couldn't wait to get away from the work environment for a few days. Several little incidents had occurred throughout this mission that bothered John and stressed the personal and professional relationships he had with the crew.

The first incident was a seemingly trivial matter between the loadmaster and aerial port squadron (APS) personnel. The loadmaster really didn't like the way APS personnel loaded the aircraft. This forced a confrontation with quality control. John, having ultimate responsibility in the matter, and probably getting a little tired of the TDY, decided to favor the APS' way of doing things. After all, the aircraft was already loaded and the APS techniques were not unsafe. The loadmaster, however, took the incident personally and seemed aloof during the rest of the mission.

Then there were the episodes with the engineer during the preflight walkaround. John had overruled the engineer twice in what he thought were insignificant matters. It seemed that if he had listened to the engineer, the aircraft would never have taken off. Anyway, throughout the rest of the mission the engineer never made *any* decisions without first consulting John.

Finally there was the copilot. John wondered if he ever listened to any radio calls. Throughout the entire mission John had to "clue" him in on numerous radio calls. The Co was a nice guy, but John couldn't believe that he ever graduated from pilot training. John was noticeably upset over the copilot's ineptitude on the radios. One day he actually had to assume radio responsibilities and fly the airplane at the same time.

This series of incidents placed a strain on the crew. John lost a little bit of the trust and confidence he had in his crew and, unbeknownst to John, the crew also lost a little confidence in him. Conversation on the flight deck was non-existent as each man kept his thoughts to himself. As the airplane approached home, each man thought about what he would do after the plane touched down.

"Crew, pilot," John said as he finally decided to get things rolling. "Let's run the descent checklist." The aircraft was about one-half hour out.

"Loadmaster, pilot—could you please report? Let's run the descent checklist!"

"Roger."

The descent check went smoothly and businesslike. John directed the copilot to coordinate an enroute descent to an ILS full stop. The weather was VMC but John could use the approach for his currency requirements.

"How much time to landing now?" John asked the copilot.

"I guess about twenty minutes," the copilot responded matter-of-factly.

"Did we inform command post of our inbound arrival time?"

"Yes sir, but we haven't received a parking spot yet."

Pokey 11 continued on radar vectors to ILS final. The approach was running smoothly. The copilot missed only one radio

Honorable Mention 1986 Flight Safety Writing Contest

call! After turning final, the crew completed the before landing checks. Everything was normal.

"Pokey 11, final approach fix, gear down, full stop," the copilot reported to approach.

Just then the crew heard a muffled pop, and sounds a pilot does not want to hear started coming in over the intercom. "We have a fire in the number-1 engine," said a somewhat anxious engineer.

About this time some incomprehensible radio transmissions came through and the copilot asked for clarification. "Say again for Pokey 11."

Major Wright sat quietly, keeping an ear open to what was transpiring over the radios and trying to comprehend the nature of the problem on the number-1 engine.

"Pilot, loadmaster. There's a fire trailing the number-1 engine."

John finally decided to take action. "Shutdown the number-1 engine."

The engineer questioned back, "Sir, you sure you want to shut down that engine? Landing is not that far away."

"Say again for Pokey 11," the copilot continued to have problems with the radios.

By this time, John had enough of the copilot and engineer. He turned to both and, grabbing the copilot's arm, said, "Shut down the number-1 engine, NOW!"

The copilot, caught somewhat offguard, looked directly back at John and, with some fear in his eyes, responded, "Yes, sir. Shutting down number-1 engine!"

Suddenly John felt something else was wrong! The flight controls felt mushy and the control yoke was beginning to shake and vibrate. As he looked outside he noticed the aircraft at 60° of bank and slightly nose low. He glanced at the airspeed indicator and could not believe his eyes. The airspeed was passing through 70 knots and decreasing! The aircraft was in a stall!

John then heard the engineer's voice over the intercom. "The number-1 engine is shut down and the fire appears out."

John could not respond as the aircraft continued to shake. How could he have let things go so far? He had violated the basic principle of any emergency—MAINTAIN AIRCRAFT CONTROL. With all his finesse he tried to roll wings level and add power. But he needed altitude to recover from the stall and he didn't know if he had enough.

As the aircraft continued toward the ground, John could not understand how he allowed the crew to so thoroughly distract him. Seven days of trivial crew problems had finally caught up. The lack of confidence John had in the crew caused him to worry too much about their jobs and not enough about his own. As long as operations were normal there was no problem. But the engine fire was the event that caused crew coordination to totally fall apart.

John Wright realized he had failed as a pilot. His primary responsibilities were to maintain aircraft control and direct the crew in an emergency. He had had a long time to train for this and he had failed. More importantly, he also failed as a leader. He failed to guide the crew in a coordinated effort during the emergency and he lacked the patience to let them do their jobs. He let small annoyances distract him to the point that they had adversely affected his judgment. His failings could possibly cost four other people their lives.

As the aircraft continued screaming toward the ground, a deathly quiet came over the crew. Tears stung John's eyes and his body became rigid. His gut rolled with the sickening certainty of what was about to happen. In a few moments it would be all over.

Pokey 11 crashed two miles short of the runway. There were no survivors.

Capt. Peter D. Pasko graduated from the USAF Academy as an honor graduate in 1979 with a degree in Electrical Engineering. After completing pilot training at Reese AFB, Texas, Captain Pasko was assigned as a C-130 pilot at Pope AFB, North Carolina where he upgraded to aircraft commander. Captain Pasko was reassigned to Vance AFB, Oklahoma in 1982 where he presently serves as Assistant Chief of Check Section for T-37s.

Naval Maneuvers

The buck stops with you!

(Editor's Note—The following hazard report, "borrowed" from the Navy, makes several points that should be required reading for maintenance folks and flight crews.)

Aircraft: C-130

Circumstances:

Evidence and Analysis. Number 1 main tank fuel gauge and the left external fuel gauge were inoperative and awaiting parts. The aircraft was defueled from approximately 45,000 to 30,000 pounds of fuel for a pilot training sortie. There is a requirement to verify the fuel load by dipping the tanks after defueling. The fuel register

was signed by the aircraft handler indicating the tanks had been dipped. The aircraft handler, in fact, did not dip the tanks. The flight engineer, during preflight, asked maintenance control about the fuel load due to a slight right list of the aircraft. Maintenance control checked the fuel register and stated the fuel load was correct. During taxi, the pilot noticed a slight right wing down tendency, but did not consider it excessive. The takeoff and flight evolution were uneventful, with no excessive trim inputs required. Throughout the flight, the flight engineer used established fuel management procedures to maintain fuel load symmetry for an aircraft with inop fuel gauges. The number 1 engine flamed out on short final for the full stop landing. Inspection revealed approximately 3,000 lbs of fuel remaining in number 4 fuel tank. Number 1 tank was empty.

Conclusion:

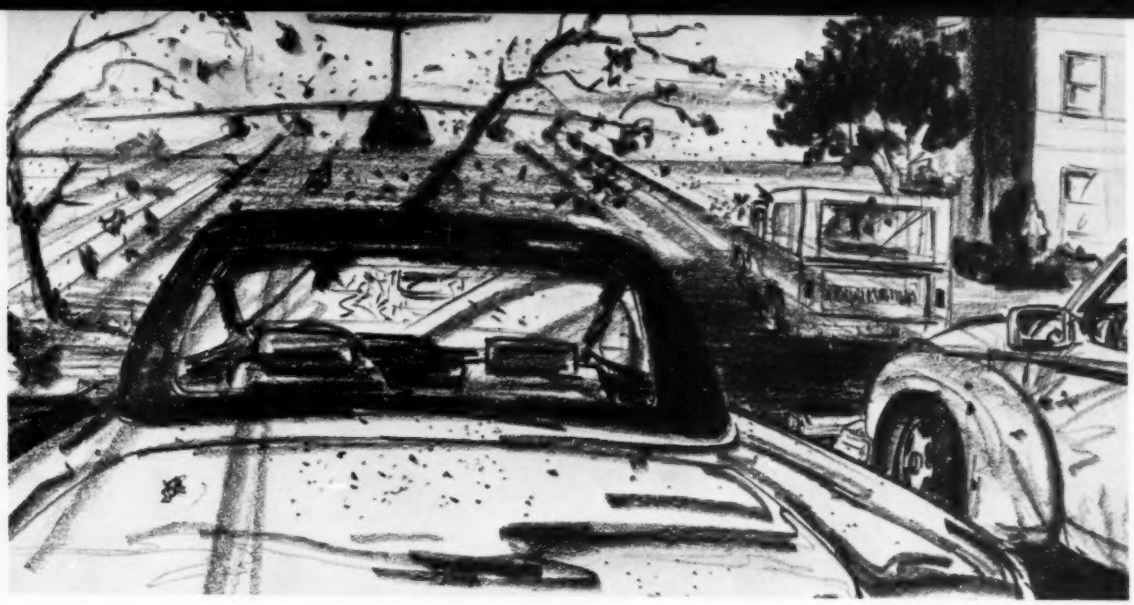
The number 1 engine flamed out from fuel starvation. Failure to dip the tanks resulted in an unbalanced fuel load. Inattention to detail and complacency could have resulted in a catastrophic but preventable tragedy.

Corrective Action:

- Squadron maintenance instructions rewritten to ensure accurate verification of fuel loads. Flight engineers are now required to dip tanks on preflight if doubt exists concerning fuel load in tanks with inoperative gauges.
- Aircraft handler training supplemented to include extensive indoctrination in aircraft fuel systems and associated responsibilities.

Commander's Comments:

This incident is a classic replay of an old, familiar story. The worker didn't work. The supervisor didn't supervise. Maintenance control didn't control. Then the flight crew accepted the aircraft with an obvious indicator that things weren't quite right—the aircraft was listing following a defuel operation with an inoperative fuel quantity gauge. Either the flight engineer or aircraft commander could have broken the chain of events by demanding a new dip of the tanks—but they didn't. Fortunately, they were good sticks and knew their emergency procedures. The only thing that happened this time was another "uneventful" three-engine landing and lots of embarrassment all around. This incident also illustrates the difficulty of eliminating personnel-error accidents. Everybody involved in this incident, from the airmen on the refueling crew to the aircraft commander, was highly experienced and had performed these tasks many times before. But, on this day, each one didn't do it right, and the others didn't crosscheck. Success in naval aviation must be a curious blend of faith and confidence in your shipmates and crewmen, strongly tempered by a healthy distrust of their actions. We all think we are well-trained and professional. We tend to assume that the other guy is too, and usually we're right. But the system is designed to ensure that we check up on each other, to guard against those times when someone doesn't know his/her job or makes a mistake. When we assume the other guy did his job, then abandon our responsibility to check him, we have set in motion events which inevitably lead to disaster. The end of this will sound as familiar as the beginning. We will counsel and retrain the individuals involved. We will review and improve our procedures and training programs. We will discuss the incident at aircrew meetings. We will probably even create new restrictions for flying aircraft with inoperative fuel quantity gauges—not because the restrictions are necessary, but to create a bigger safety margin to keep someone else from making the same mistake. When all these actions are complete, the question will still remain: Has this ensured that everyone will do their job right, every time? When we find the means to answer "yes" to this question, then we will have learned how to prevent aviation mishaps.



Prop/Jet Blast

You can make a difference

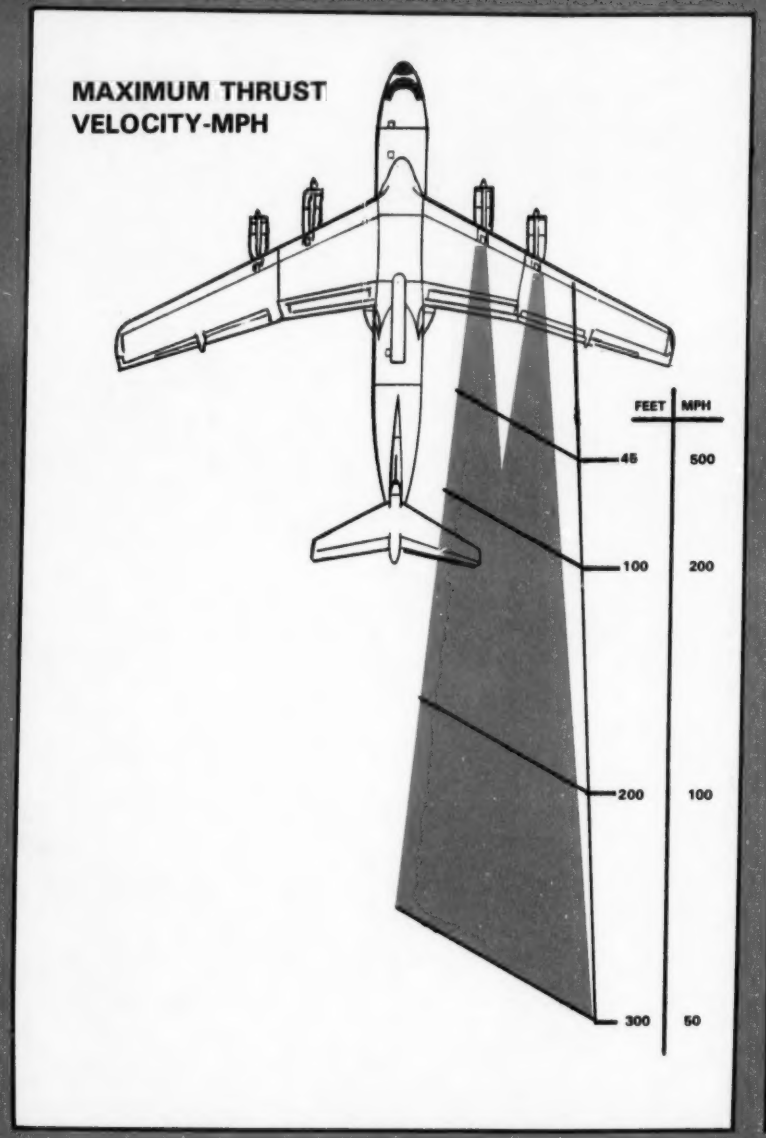
The deleterious effects of intruding on the "cone of ferocity" created by our multi-engined blast producers can be lasting and expensive, at the least. The circumstances surrounding damage caused by prop/jet blast are as varied as the number of incidents themselves, but they all seem to have a similar thread of lack of coordination amongst them. A couple of examples from the "real" world might help illustrate the point.

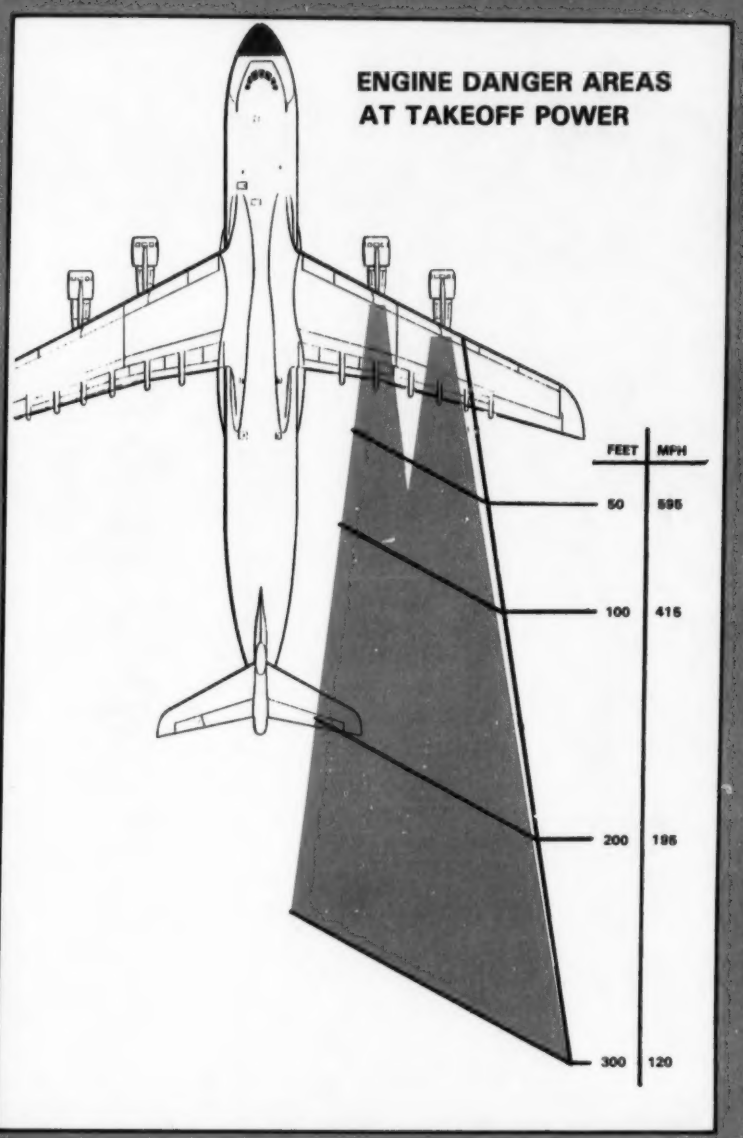
Maintenance requested the C-141 crew perform an engine run to facilitate troubleshooting. To work the problem, *maximum* power was necessary, and the crew complied. This was, after all, a *maintenance* engine run with the approval of ground control. As you may have already guessed, the technician was unfamiliar with C-141 engine run procedures. During the run, the jet blast blew rocks, tree limbs and other debris into several privately owned vehicles.

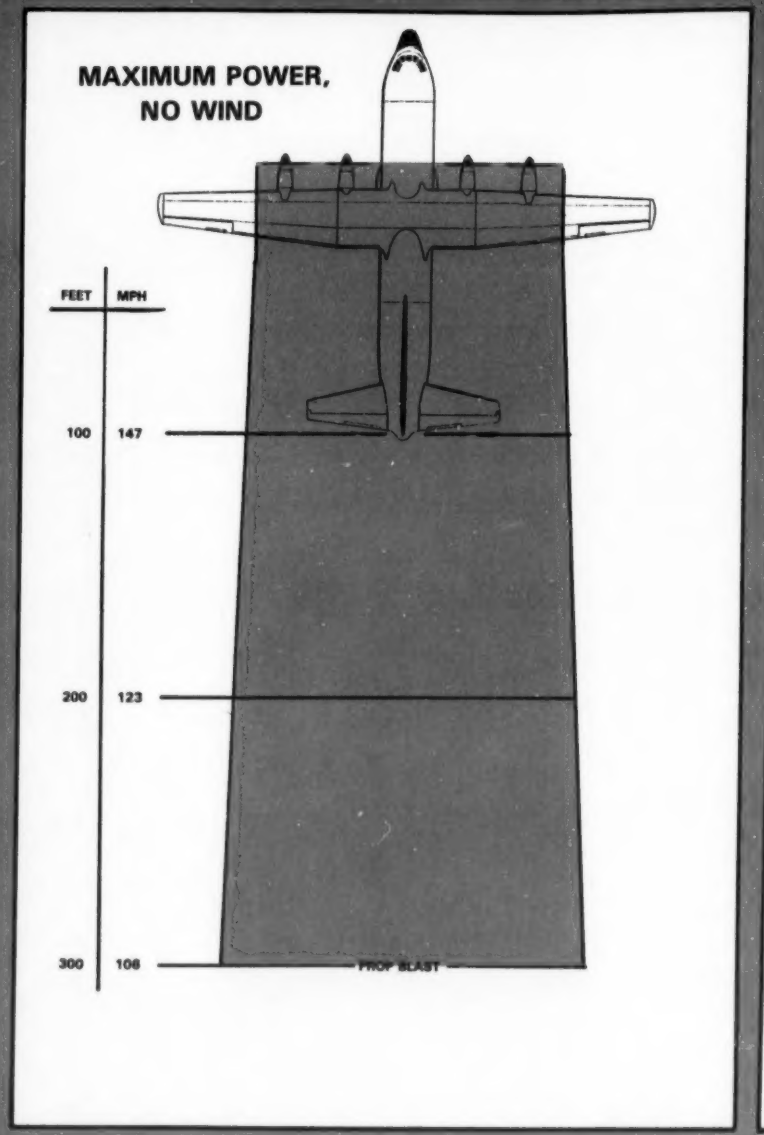
In another typical incident, a C-130, blocking in at a foreign base, made a marshaller-directed 90° turn, which placed the tail of the Herk facing a single-engined Cessna. You guessed it—the Cessna was blown over.

A final example from our intra-cockpit coordination files . . . . A C-141 local training sortie, the instructor in the right seat, upgrade student in the left. When the trainee had to use sustained power for block-out, the instructor suspected a parking brake problem and had the trainee retard the power to idle. As it turned out, the parking brake had not been fully released by the trainee. The damage, however, had already been done. The jet blast, coupled with gusty conditions, had propelled a crate containing a main landing gear door into the number 4 engine nacelle of another C-141. The crate had been positioned in front of the ill fated Starlifter in preparation for installation of the door.

The bottom line is we all need to work together, coordinate our actions, and be mindful of the ground effects of our source of flight power. To help in this endeavor, we've printed some prop/jet blast information on the next two pages which we hope will be useful to aircrew, airfield management, maintenance, and safety folks.


MAXIMUM THRUST
VELOCITY-MPH
FEET
MPH
45
500
100
200
200
100
300
50


ENGINE DANGER AREAS
AT TAKEOFF POWER
FEET
MPH
50
595
100
415
200
195
300
120


MAXIMUM POWER,
NO WIND
FEET
MPH
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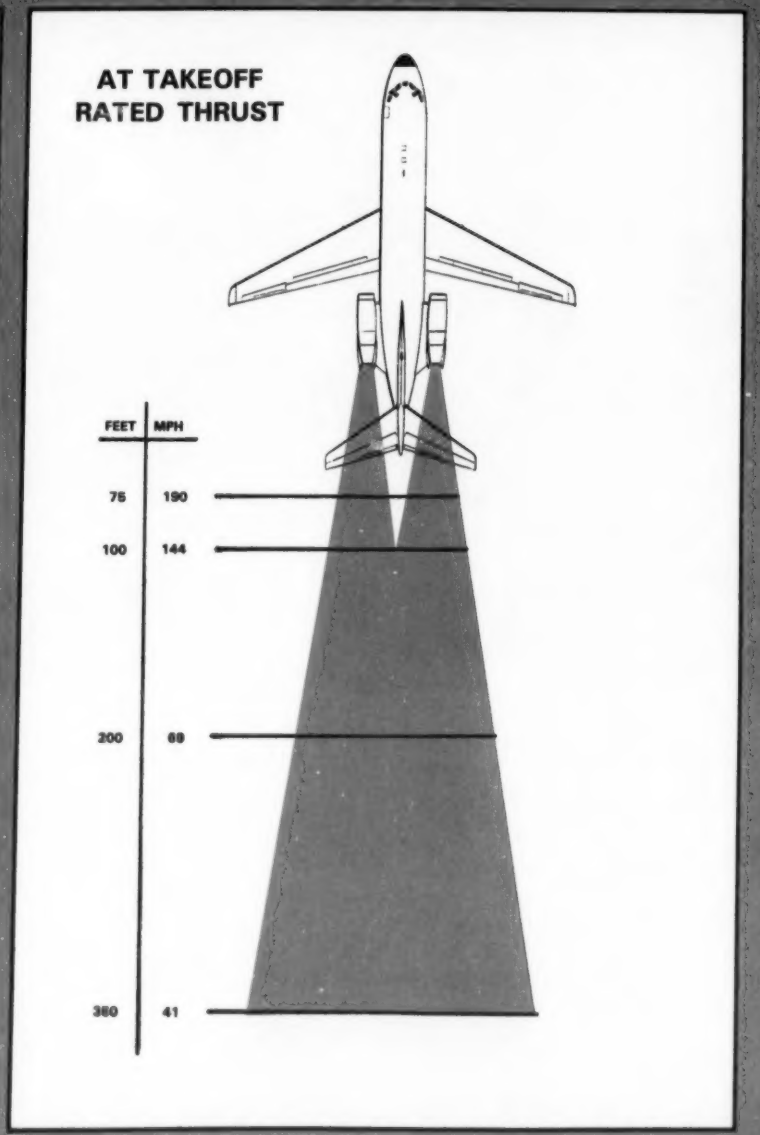
147
200
123
300
106
PROP BLAST


AT TAKEOFF
RATED THRUST
FEET
MPH
75
190
100
144
200
89
360
41

Terminal Radar Guidance

A new ending

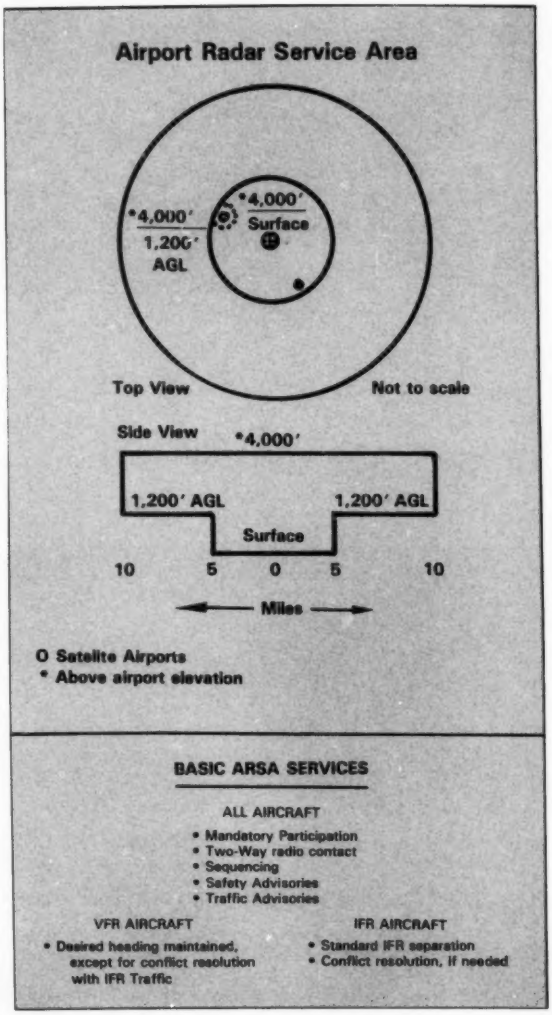
Many of the nation's busiest airports have been identified by the Federal Aviation Administration as candidates for a new airspace configuration designed to replace Terminal Radar Service Areas (TRSA). The new concept is intended to improve safety and relieve traffic problems arising from the presence of aircraft not in contact with ATC.

Such problems have been eliminated from the "Top 20" busiest U.S. airports, where the Terminal Control Area (TCA) concept exerts positive control over all traffic. At the next busiest level of airport activity (about 140 such airports have been identified) a *voluntary* system of providing pilots under VFR with ATC radar advisory services has been in effect for the past 15 years. Traffic advisories were initially offered, as were later sequencing and continuous traffic separation, within a given airspace configuration known as a Terminal Radar Service Area.

VFR pilot response to the TRSA concept has been good overall, with many positive benefits. However, the basic problem remained: the presence of some non-participant radar blips signifying targets whose altitude, aircraft type, flight intentions, etc., are unknown to the controllers. These unknowns interrupt the smooth, efficient flow of traffic and sometimes pose potential conflict hazards. Air carriers and other IFR users have argued that all TRSAs should be converted to TCAs.

On the other hand, some pilots have criticized the non-standard shape of TRSA airspace with its variety of tiers and cutouts; the varying range of VFR services offered at the TRSAs; the apparent priority given to some non-participating aircraft; and the perceived "over-control" resulting in detours or delays during peak hours.

After considerable discussion with representative segments of aviation, including general aviation pilot associations, airport authorities, and air traffic organizations, the FAA has proposed phasing out TRSAs and replacing them with a new concept—the Airport Radar Service Area (ARSA), which is far less restrictive than the TCA but calls for mandatory participation. A year-long confirmation of the ARSA prototype at field locations in Texas, Ohio, and Maryland reported very positive results.



Like the familiar Airport Traffic Area the new ARSA is cylindrical in form beginning at the surface with a five nautical mile radius. At 1,200 ft AGL, however, the cylinder

expands to a radius of 10 miles and continues upward to a height of 4,000 ft above the primary airport elevation, giving it roughly a mushroom shape. Cutouts or irregularities from the basic design, to accommodate secondary airports, other regulatory airspace, topography, etc., will be allowed on an individual airport review basis. Controllers will be required to start providing ARSA services for all aircraft that enter the airspace surrounding the ARSA—the airspace between the edge of the ARSA at 10 miles from the tower out to approximately 20 nautical miles from the tower, extending from the lower limit of radar receptivity to the upper limit of approach control airspace if requested by the crew.

An ARSA will enclose a primary, tower controlled airport and may include one or more satellite airports. Flight operations within the area are subject to the following requirements:

- Arrivals and Overflights. Two-way radio communication must be established prior to entering the area and maintained while within the area. Initial radio contact is with Approach Control, at a recommended distance of 20 miles from the primary airport.
- Departures. Two-way radio communications must be established by the usual airport routine for the primary airport and then maintained with ATC while within the area.

When flying in an ARSA, VFR pilots should expect to receive *sequencing* for landing; *safety advisories* where appropriate (significant weather information, airport conditions, bird hazards, etc.), *traffic advisories*; and *conflict resolution* when there is an apparent convergence with an IFR aircraft.

Note there is a considerable difference between traffic advisories and conflict resolution. The former merely calls attention to aircraft whose flight path may become a problem; maintaining a safe separation remains the pilot's responsibility. *Conflict resolution* involves vectors issued to either a VFR aircraft *or* an IFR aircraft (or both), at the same altitude, and requires changes of course and altitude.

The first regulatory ARSAs were established in mid-March 1985 at Austin, Texas; Columbus, Ohio; and Baltimore, Maryland. Controllers and pilots alike have commented favorably on the advantages of knowing where all the traffic is at all times, and the absence of detours.

Traffic under positive control in the Baltimore ARSA has increased 30% to 35% since the change was made, but controller workload has actually *decreased* because VFR vectoring is seldom needed. For IFR pilots the "stretching" of ATAs into ARSAs (and the dismantling of TRSAs) will have little noticeable effect on their operation, except for lessening their concern about uncontrolled aircraft with unknown intentions.

Application to MAC. Although most MAC flight operations are conducted under IFR, some *are* flown under VFR and the changes described should make for safer flying under either category. However, no matter how "controlled" VFR traffic becomes in terminal areas, when flying in visual meteorological conditions, it's still *your* responsibility to *see and be seen*.

Reprinted from FAA General Aviation News

LIST OF ARSA CANDIDATE LOCATIONS

Anchorage, AK

Birmingham, AL
Huntsville, AL
Mobile AL
Montgomery, AL

Little Rock, AR

Phoenix, AZ
Tucson, AZ

Burbank, CA
Monterey, CA
Oakland, CA
Ontario, CA
Palm Springs, CA
Sacramento, CA
San Diego, CA
Santa Ana, CA

Colorado Springs, CO

Windsor Locks, CT

Daytona Beach, FL
Ft. Lauderdale, FL
Jacksonville, FL
Orlando, FL
Pensacola, FL
Tallahassee, FL
Tampa, FL
W. Palm Beach, FL

Columbus, GA
Macon, GA
Savannah, GA

Kahului, HI

Cedar Rapids, IA
Des Moines, IA

Boise, ID

Champaign, IL
Moline, IL
Peoria, IL
Rockford, IL
Springfield, IL

Evansville, IN
Fort Wayne, IN
Indianapolis, IN
South Bend, IN

Wichita, KS

Cincinnati, KY
Lexington, KY
Louisville, KY

Baton Rouge, LA
Lafayette, LA
Lake Charles, LA
Shreveport, LA

Baltimore, MD

Portland, ME

Flint, MI
Grand Rapids, MI
Kalamazoo, MI
Lansing, MI
Saginaw, MI

Gulfport, MS
Jackson, MS

Billings, MT

Charlotte, NC
Fayetteville, NC
Greensboro, NC
Raleigh, NC

Lincoln, NE
Omaha, NE

Atlantic City, NJ

Albuquerque, NM

Reno, NV

Albany, NY
Buffalo, NY
Islip, NY
Rochester, NY
Rome, NY
Syracuse, NY
White Plains, NY

Akron-Canton, OH
Columbus, OH
Dayton, OH
Toledo, OH
Youngstown, OH

Oklahoma City, OK
Tulsa, OK

Portland, OR

Allentown, PA
Erie, PA
Harrisburg, PA

San Juan, PR

Quonset Pt., RI

Charleston, SC
Columbia, SC
Greer, SC

Bristol, TN
Chattanooga, TN
Knoxville, TN
Memphis, TN
Nashville, TN

Abilene, TX
Amarillo, TX
Austin, TX
Beaumont, TX
Corpus Christi, TX
Lubbock, TX
Midland, TX

Salt Lake City, UT

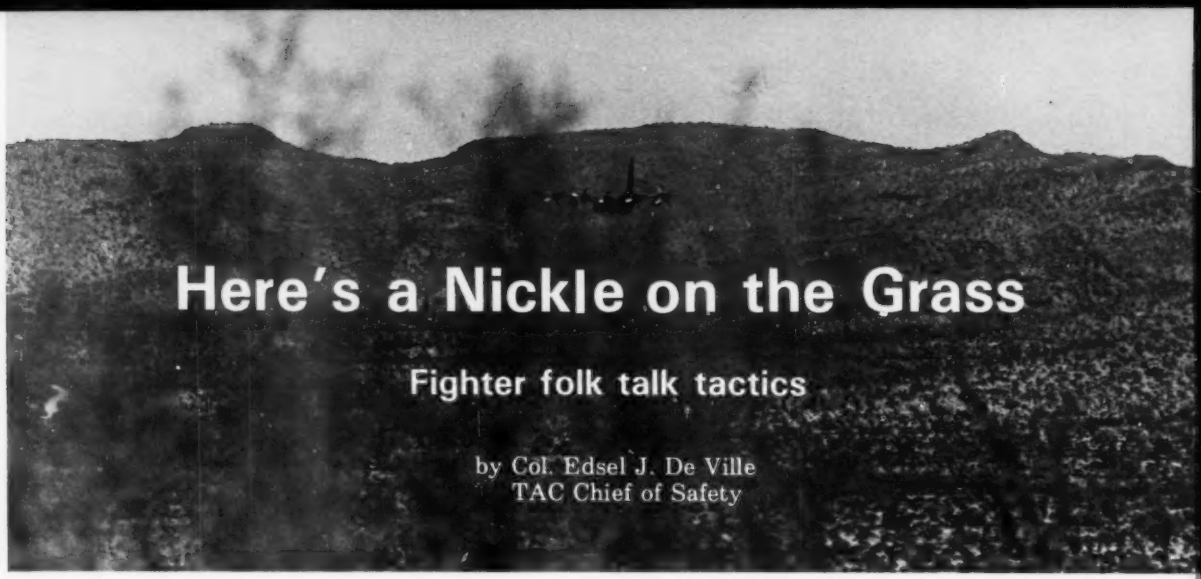
Chantilly, VA
Norfolk, VA
Richmond, VA
Roanoke, VA

Burlington, VT

Spokane, WA
Tacoma, WA

Green Bay, WI
Madison, WI
Milwaukee, WI

Charleston, WV



Here's a Nickle on the Grass

Fighter folk talk tactics

by Col. Edsel J. De Ville
TAC Chief of Safety

(Editor's note—While the following article is written with a "non-crew complement" attitude, it makes some excellent points to ponder. Col De Ville promotes an attitude and discipline which can reduce crew workload, and that translates to a greater margin against sensory overload. Many of our mishaps are classified as human factors mishaps, and anything we can do to prevent extraneous events from disrupting smooth in-flight procedures is more than worth the time. Bear in mind this article applies to both interplane and intraplane R/Ts for MAC crews in general and formation fliers in particular.)

One thing for certain in our business is change—you name it . . . jets, tactics, threats, technology, leadership—it all changes. Our challenge is to adapt to better methods while continuing to be the best. Sometimes it's difficult to evaluate just how good or bad a certain change will be. On the other hand, we have been handed down some solid indicators of excellence that will never change. Radio discipline is one. So for all you silver-tongued "aces-to-be," here's a nickle on the grass . . . .

It's often been said, "you can tell how well a mission will be flown by the way the flight checks in." There's an awful lot of truth in that statement. For us old heads, it means much more than whether or not someone had a problem prior to or during the initial check-in. A sharp, crisp "Hawk Flight, check—Toop, Threep, Fourp," does more than sound good. It sets the rhythm, establishes the discipline, and underlines the goals of the mission—to be the best.

Unfortunately, we all fall victim to the routine of things—a tendency to relax once the difficult is over and the familiar begins. The problem isn't "doing the same old thing," it's doing something *familiar* without a *challenge*.

How many times have you rolled in for a 30° dive? When would you call it routine? Never, because no matter how often you make that pass during your career, the challenge remains—getting a "bull." That's why many smoking holes are dug during the so-called "ho hum" part of the mission—no challenge. That's the leader's responsibility. He must present a challenge to his flight on every mission—and gear that challenge to each flight member. He can't relax or let up for one second because he's the leader—it's up to him to maintain the discipline within the flight. Ask the ones with the gold stars on their sleeves if they were relaxed while earning their combat time or if discipline was important on every mission.

The thing that upsets me is how easily discipline can begin to erode as the result of a subtle radio transmission. Most of the time the troops in the flight don't even realize it. Herein lies the real problem.

Here's an example. You're flying along in tactical formation, doing your job as number 2, checking for near rocks at 12, far rocks at 12, lead looks good, now check 6 . . . crosscheck the big picture . . . remember to

use flare/chaff . . . is it "flash" time yet . . . review our tactics once more. You've got your mental crosscheck going smoothly at the speed of heat. Then you hear the mike switch being keyed—anticipate a wing flash—when you hear, "Hey, Joebag, sure is a great day. Look at that beautiful home at your left 8 o'clock low."

Will you reply? Most of us do. Then what? What's happened to your mental crosscheck? It's "outta there." And, if a few more comments unrelated to the task at hand are exchanged, the chances of re-establishing the correct rhythm are lost. The same can happen when nicknames are used (in a critical emergency, nicknames can help, but that's another story). Failure to use the flight call sign starts the erosion of discipline, too. A simple informal radio call. A simple tone of relaxation can key the trigger to self-discipline breakdown. We've all heard it deteriorate at one time or another in flights, to a point where someone—usually from another flight—finally keys the mike and calls, "take the garbage off the radio."

Disgusting, isn't it? But why? Well, mainly because we allow it to happen. But I see two primary reasons. The first is self discipline. If you are the leader, you must resist the temptation to garbage up the radios with information/comments that should have been covered during the briefing, or transmissions unrelated to the mission. If you are flying the wing, resist the urge to answer such transmissions and have the courage to debrief it.

The second reason is we're overloaded with radios. Radio operators during the brown-shoe days should have had it so good. Some of us have grown accustomed to having our "personal" flight radio and frequency. Naturally, no one else is listening (an important check and balance that's missing); so we tend to use that frequency as we would a private telephone—before you know it, the flight call sign sort of fades away, replaced by first names of the flight members or even nicknames. That leads to a more informal attitude, which leads to . . . I could go on and on.

What gets me in the pit of my gut is when you hear someone actually joke over the radio about a bad bomb or a dumb maneuver they made during an engagement. They should be busy analyzing what they did wrong instead of using any one of the 3033 Amarougian excuses for their poor performance. That's what it is and should be to them—unacceptable performance.

Another thing that has grown out of "a radio and frequency for everyone" is the fighter-to-fighter brief. I've heard some that were more detailed than any I've heard in the briefing room. That's backwards. Even a crawfish will only back up so far before he realizes it may be fun and a fast way to evade, but it's no way to fight. So, he puts up his claws and heads back in the right direction.

Radio discipline is something we need to re-examine periodically, just to make sure we're not backing up. If we don't, we're soon like the crawfish who's been backing up so long he thinks it's the proper way to move forward. That's why we need to examine our radio discipline now and then, just to make sure we're not comfortable doing something that would be totally backward (and tactically unsound) in combat.

In combat you may only have one chance to make a transmission. When you do, it has to be crisp, exact, and to the point. Most important of all, the right person must receive it. For this to happen, all you need is the proper call sign. It works like magic.

Well, if you think I haven't been throwing this nickle your way—try this. For you jocks using several radios, pick one radio on your next mission—only one—and use *it*, nothing else. See if you are briefing properly—or need to revamp your tactics. For the rest of you interested in being the best, make R/T a debrief item—don't just mention it—debrief it. One thing more, take a recorder (VTRs don't last the entire flight) and charge two bits for every "Uhhh" you hear in your flight. It's amazing, just amazing, how quickly the "Uhhhs" fade out completely from the squadron R/T. Is it really the two bits lost, or because someone gave them a gut-check?

Radio discipline, just like formation, is a key indicator of how squadrons perform. R/T that's crisp, sharp, to the point—with a toop, threep, fourp response—means pride, high performance standards, and . . . you mess with us, we'll rip your lips off.

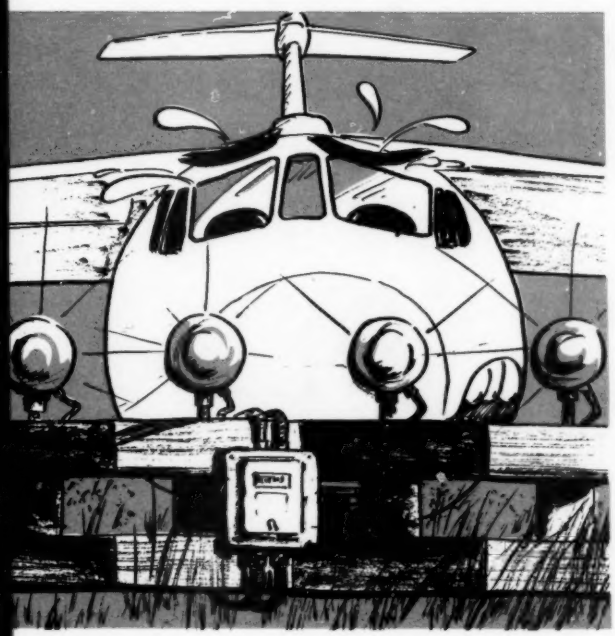
Quick Stoppers

DIVE TURKEY

This C-130 crew was perfecting their Low Altitude Parachute Extraction System (LAPES) procedures. They were maneuvering to the west of the airport, beginning a right turn back toward the base. As they crisply executed this aerodynamic maneuver, they witnessed a lone Turkey Vulture diving at the right wing. The pilot initiated evasive action. The crew didn't feel the expected impact or see any damage, so they concluded they'd successfully avoided the vulture. They continued their mission, honing their skills to razor sharpness. After yet another flawless landing, they terminated the sortie. During the post-flight inspection, the flight engineer discovered a dent 3 inches deep, 18 inches long and 8 inches wide on the wing. Solving the mystery of what caused the dent didn't take long because the FE recognized the carbon-based material on the wing—bird residue. The application of said residue was accomplished with such force it dented the right external fuel tank nose assembly, which had to be replaced to the tune of over $8,000. Sometimes those turkeys make quite an impression.

JUST ONE LITTLE THING

The twin-engine airliner was peacefully cruising along at FL 350 when both engines flamed out due to *fuel starvation*. The pilots were able to restart the engines at 12,200 ft after turning on the center fuel tank boost pumps. Seems the pilots never completed the climb checklist because they were distracted during climbout by an ATC-directed heading change and a knob coming off the digital flight guidance system. As a result, the item "fuel pumps checked" was missed, and the center fuel tank pumps weren't turned on until the pilot caught the error during the restart. After the main tanks went dry, the engines, predictably, quit. If it isn't one thing, it's another.



OH, JUST HANGIN' AROUND

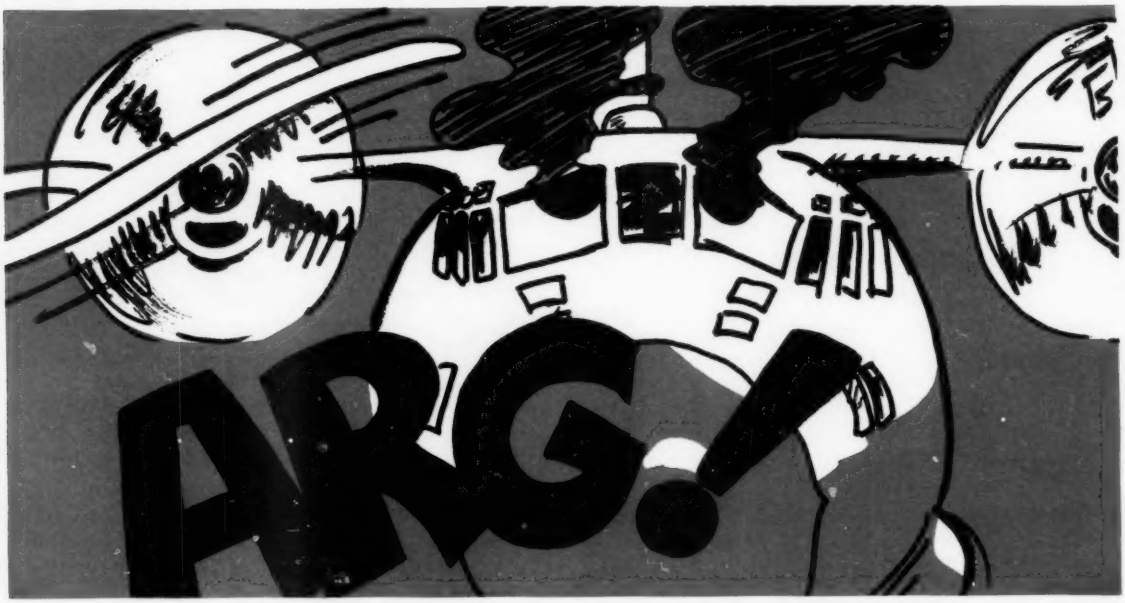
That's what a PJ found himself doing recently after jumping from a UH-1N. He'd already completed three jumps and was trying another, this time a full equipment static line jump. With the helo at 3,000 ft AGL, 70 KIAS, and in level flight, he jumped, only to have his lowering line wrap around the aft crossover tube, creating a half-hitch tension knot, and leaving him suspended approximately four to six feet under the left skid. The jumper indicated to the safetyman in the helo that he was conscious, had a usable reserve, and was waiting to be cut free. A check revealed he had not fallen far enough to deploy his main chute, and if cut free, his main chute would deploy normally. On command from the AC, the safetyman cut the lowering line and the parachute deployed normally. The jumper descended under his main canopy and landed safely, undoubtedly eager for his next jump.

NO BRAKES? KEEP ON FLYING!

When it comes to handling airplanes, it always pays to keep "flying" them from chock-out to chock-in. One Starlifter crew found out why when they were on a no-flap landing roll with 3,000 ft of runway remaining and 100 knots of airspeed—*with no brakes*! Everything seemed normal, even the pedal pressure felt right. But the pilots needed to switch to emergency brakes before pedal pressure equated to stopping power. Trying unsuccessfully to stop on the runway with emergency brakes, the pilot locked up the tires as he watched the approach lights fill his windscreen. Remarkably, he didn't hit a thing as he "flew" the plane 500 ft onto the overrun. The late-night adventure cost the aircrew some perspiration and the airplane four flat-spotted tires. This incident proves it pays to keep flying your plane—all the way back to its parking spot.

Courtesy of Capt. Bernie Goldbach 437 MAW, Charleston AFB, SC

Quick Stoppers



HOT PANES

Recently a Hercules, of the 4-engined variety (and its crew), completed their run-up and, after clearance, took the active, ready to take off. Just before brake release, the crew heard a noise that sounded like a blowtorch. Right after that, the crew witnessed flames shoot halfway up the windshield. There was also some accompanying smoke, but it quickly dissipated. The crew had turned on the NESA windshield anti-icing system about three minutes earlier. Wisely concluding the NESA heat may be involved, they pulled the appropriate circuit breakers and taxied the hot Herc back to the parking spot.

The cause of this mysterious random temperature excursion? Not clear, unfortunately, but at the time of the incident, torque values for C-130 windshield power and thermistor studs weren't published in the applicable TOs. A historical review of NESA window system malfunctions revealed overtorqued studs (thermistor type) can and have caused similar mishaps. You've got to be careful when torquing your studs!

HOT PANES II

While leisurely cruising along in their sturdy Herc, the crew noticed smoke coming from the copilot's rudder pedal area. The smoke appeared to be emanating from behind the glare shield. The AC directed a combined smoke and fume elimination and electrical fire checklist. While the crew was attempting to identify the source of the smoke, a 6-inch flame shot out from the NESA heat electrical connecting stud on the center windscreen. As the report so aptly stated: "This ended what could have been a very difficult troubleshooting phase." A HALON fire extinguisher was used to put out the fire, which by now was being fed by the sealant connecting the window to the electrical source. After landing, the flight engineer noticed pitting of the connecting stud and reinforcing materials. The pitting created a "pocket" between the stud and the window. Water collected in this area, leading to a short circuit and the fire. Chalk one up for the engineers.

After Deadlines

ARE YOU A SURVIVOR?—If so, this announcement from the survival folks at Fairchild may interest you. "Do you have a survival story you would like to share? We are looking for people like you who have experienced a survival episode, either military or civilian, which can be used to enhance our training. We will use your valuable experience to let others know what might be expected and how they might feel. Please contact us at 3636 CCTW/DOV, Fairchild AFB, WA 99011-6024, AUTOVON 352-2371/2171 or Commercial extension (509) 247-2371/2171."

KILL THOSE BUGS!! The Air Force has awarded a $5.4 million contract to the Lockheed Georgia Co. to develop, build and test two prototype modular aerial spray systems for use on Air Force Reserve C-130 aircraft. Following fabrication, installation and testing, the prototype systems will be turned over to the 907th Tactical Airlift Group, Richenbacker ANG Base, Columbus, Ohio. The 907th, previously equipped with spray-equipped C-123 aircraft, has used its aircraft on numerous missions worldwide, including mosquito control in Guam, gyspy moth control at West Point, New York, pine loopers at Otis AFB, Massachusetts, grasshopper control in Idaho, and a mission in Panama combatting encephalitis.

LET ME MAKE THIS PERFECTLY CLEAR. In the "Excellence in Airmanship" in the July **TMF**, some readers expressed concern over the length of time the HH-3H hovered close to the salt water. The crew hovered three times at 2 to 5 ft for a maximum of 30 seconds each time, for a total time of not more than 1 minute and 30 seconds. Obviously, this is much less than the 30 minutes the narrative may lead the reader to believe.

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Touch 'n Go

How about that, Crenshaw? You really can hear the ocean through one of these things.